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ON A BLOCK OF RED GLASS ENAMEL SAID TO HAVE BEEN FOUND AT TARA HILL. By V. BALL, C.B., LL.D., F.R.S., Director, Science and Art Museum, Dublin. WITH OBSERVATIONS ON THE USE OF RED ENAMEL IN IRELAND. By MARGARET STOKES, Hon. Member, R.I.A.

Plate XIX.

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V.

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[Read January 11, 1892.]

In June, 1887, a block of an externally stony-looking and internally red substance weighing about ten pounds was offered for sale at the Science and Art Museum by Mr. Francis Rogers of Kilmessan, who stated that it had been found at Tara Hill many years previously. On examination the substance proved to be of artificial origin, and Mr. R. J. Moss, F.C.S., through whose hands it first passed, ascertained that it contained a large percentage of copper oxide, to which its brilliant red colour was, accordingly, attributed. The specimen was then purchased and put aside. A few months ago I came across it, and, after submitting it to further examination, arrived at the conclusion that it was not a metallurgical bye-product or glass slag, but a carefully prepared homogeneous red glass enamel. It, moreover, occurred to me that it was similar in appearance to some of the enamel used in sundry well-known specimens of Celtic *champlevé* work which are in the Royal Irish Academy Museum. This supposition was confirmed by comparison, and by the opinions of Miss Margaret Stokes, Major McEniry, and Mr. W. F. Wakeman. A sample was also forwarded to Mr. A. W. Franks, C.B., of the British Museum, from whom an exceedingly interesting reply has been received, together with samples of red enamel dug up in Rome, which present a startling resemblance, even in their microscopic characters, and in the decomposed condition of their surfaces, to the material of our Tara specimen.

Mr. Franks then wrote as follows, and has since, in conversation, confirmed his opinion as to the importance and interest of the discovery:—

"I have been very much interested with the lump of opaque red glass, which is what the Italians would call *porporino;* from the greenish appearance of the older surface, it would seem to have been coloured with copper.

"It is very like the red of the Celtic enamel; and now comes the question whether it was made in Ireland or imported, as a great many fragments of various tints are found about Rome.

"I enclose three specimens—one is the lid of a modern snuff-box, which I bought for the sake of an old enamel set in it. This is somewhat yellower than usual. The other two fragments are from Rome.

"You will see how thick the deposit is on the surface of one of them. The other formed part of the wall decorations of the villa of Lucius Verus, near Rome.*

"A number of small pieces of red glass or enamel were found at Mount Beuvray, near Autun, with remains of a factory of Celtic enamelled work, and are described by J. G. Balliot and Henri de Fontenay, 'L'Art de l'Emaillerie chez les Eduens,' Paris, Champion, 1875, with Plates.

"The red was, no doubt, used as imitation coral.

"I ought to add that the Russian Imperial Fabrique has made a fairly successful attempt to imitate *porporino*, but that it is very dear. We have a specimen here."

As to the authenticity of the statement, referred to above, regarding the discovery of our specimen at Tara, I see no reason to doubt the general accuracy of the story told by Mr. Francis Rogers, which he has persistently repeated on several occasions, when inquiries were kindly made on my behalf by Sir Andrew Reed, through Mr. Jephson, Inspector R.I.C., and by Dr. Gage, of Trim. Besides this, Mr. James Brenan, R.H.A., and I paid a visit to Kilmessan on the 26th of December last, when we invited Mr. Rogers to accompany us to Tara Hill, where he pointed out the exact spot where he said he had found the specimen. It is on the inner slope

* See Mr. Nesbitt in "Archæologia," vol. XLV., p. 271, and his Catalogue of Glass at South Kensington.

of the northern portion of the ditch surrounding the Rath of Caelchu. Mr. Rogers then stated that, about thirty years ago, some stranger, an antiquarian he believed, commenced an excavation there, and there is a scar still on the surface of the rath which, he thinks, may mark the position of that excavation. The block, which he first observed as it lay on the surface, may, he says, have been thrown out of the excavation. In its then state, with an encrustation all over it, it was not a remarkable object; still it attracted his attention, and he took it to his house, where, from time to time, he struck pieces off it, which disclosed its internal colour and structure. So it remained till 1887, when he first took it to a Dublin jeweller, and then, by his advice, brought it to the Museum.

Another account received from Mr. George Wilkinson, of Curtistown, near Kilmessan, is, that either this piece, or a similar one, was found at Kilmessan itself, in a sand-hill which was removed when the Meath Railway was being opened. When first dug up it was the size of a man's head, and was, indeed, supposed by some persons to be one in a fossil condition. For some time it is said to have been left lying at the Railway Station, and Mr. Wilkinson obtained a piece, of which he sent me a small specimen for examination. It proves to be identical in character with the larger piece (Mr. Roger's) in our possession.

Mr. Englishby, of Kilmessan, writes that about thirty years ago Mr. Rogers showed his specimen to the late Mr. Conwell, M.R.I.A.,* and adds that while Mr. Rogers maintains that it was found at Tara, a small sample of a similar material was also found at Assaye.

Despite discrepancies, all these witnesses concur as to the fact of the discovery of one or more pieces of this red glass enamel in the region about Kilmessan and Tara Hill some thirty years ago, and the encrusted and decomposed condition of the surface of our specimen *incontestably* proves that it had been buried in the ground for a very long time previous to its discovery.

Whatever of permanent value this Paper may prove to have in connexion with the elucidation of the history of Celtic enamel work, it will be sufficiently apparent to all readers that this value is mainly due to the

* Mr. Conwell, it is said, attributed to it either a celestial or volcanic origin.

cordial assistance which has been received from those whose contributions are quoted on subsequent pages. Dr. Emerson Reynolds, F.R.S., gives the following account of the results of his chemical examination of the specimen; it will, no doubt, have a special interest for those engaged in the manufacture of modern enamels:—

Analysis of Red Enamel.—"The substance, when examined in thin slices under the microscope, was seen to consist of a slightly yellowish transparent glass, through which numerous opaque red particles were somewhat irregularly scattered.

"The red material, to which the enamel owes its colour, proved to be red oxide of copper (cuprous oxide), and the glass a tolerably pure silicate of lead and sodium, *i. e.* a variety of flint glass.

"As the enamel could not be perfectly homogeneous, analyses of different portions of the mass were made, and the mean results given below represent the average composition of the material:—

Silica,	43·28
Lead Oxide,	32·85
Sodium Oxide,	9·82
Potassium and Calcium Oxides, and loss,	1·44
Aluminum and Iron Oxides,	2·75
Cuprous Oxide,	9·86
	100·00."

Dr. John Joly, F.R.S., states that he has found that "the melting-point of the enamel is 686° C. (that of pure silver being 954° C.). It melts to a dark green transparent glass. Its specific gravity is 3·48—the melting-point is well defined, not like that of a silicate, which is always (or generally) uncertain owing to viscosity. There is very little viscosity about the enamel. It would be a useful substance for many purposes if we knew how to make it, as it is very hard, about 5 in the scale."

Mr. Edmond Johnson, of Grafton-street, Dublin, writes, "that there is no doubt that the substance is a true enamel, but that his enamellers cannot fuse it easily. It adheres to copper, but its colour becomes changed to dark green—nearly black." He suggests that it may have been used as a hard

enamel ground on which softer enamels could be fused without affecting the ground.

After full consideration of the facts disclosed by the laboratory examination and the practical trial, and after some conversation with experts, I am driven to the conclusion that, whether purposely or by accident, this material is the result of the fusion together of a quantity of the constituents of red enamel—for enamelling, in the true sense, the substance is therefore exhausted; it has produced a beautiful red colour *once*, but if again fused it changes to a very dark green. It must not be forgotten, however, that the temperature of cooling affects the final colour of glass.*

It is possible that the substance may have been used for fashioning into ornaments as an imitation coral. There are, indeed, grounds for regarding some of the Celtic enamel work, so called, as being really of the nature of inlay (the thin laminæ of the glass having, apparently, been chipped into shape for the purpose, and then inserted). In fact, the substance, as already stated, is closely allied to the material called *porporino*, &c., which is still used for inlaying, &c. Of somewhat similar character, perhaps, is a material said to be made in Vienna; it is sliced and used for mosaic work and cutting into boxes.

OBSERVATIONS ON THE USE OF RED ENAMEL IN IRELAND.

By MARGARET STOKES.

We may now consider the light which this discovery throws on the history of our native arts. As Mr. Franks remarks, in his letter already referred to, the question arises whether it was made in Ireland or imported

* And in that connection the facts mentioned in the following extract, kindly furnished by Mr. Franks, should also be taken into consideration:—"Flint glass manufacturers produce a beautiful red from a mixture of copper and iron, and sometimes accidentally; for instance, when the ordinary metal, mixed specially for light green medical bottles, is nearly worked out, it will assume the complementary colour, viz. a ruby red; so that the same bottle will be parti-coloured, red and green. The chemistry of colours depends upon a very nice adjustment of relative quantities of carbon and oxygen, as well as of colouring oxide, and of alkali or lead."—Apsley Pellatt, "Curiosities of Glass Making," Lond. 1849.

into the country. This will, probably, remain a question for some time to come, but, whether or not, the discovery is no less important, since the mere importation of a lump of this size to Ireland, and its discovery in the foundations of an historic rath, prove that such material was required here in the rough, and in the lump, by native artizans and jewellers—material to be worked up into the horse-trappings, shields, sword handles, and personal ornaments of the inhabitants of Ireland and Great Britain in the late Celtic period. If imported at all, it is more likely to have been imported from Britain than from the Continent.

M. de La Borde, in his remarks on the history of Enamel, is of opinion that the art of applying glass to metal, and of solving it by fusion on heated metal, was unknown to the Egyptians, Phœnicians, and Greeks. Having gathered all possible information on the private life of the ancient Romans, and examined a variety of their coloured glass ornaments, he confesses he could find no trace of enamel fixed by fusion on metal. In the beginning of the third century of the Christian era we have the first direct mention of this Art of Enamelling from the pen of a Greek writer in Rome, who speaks of the art as a novelty to him.* Philostratus, a teacher in Athens, left that city to seek his fortune in Rome, where, by favour of Julia, wife of Septimius Severus, he was admitted to the imperial palace. He has left a curious work called "The Icones," in which he describes a series of paintings, one of them a boar hunt; and after mentioning the variegated trappings of the horses, he adds: "They say that the barbarians who live in (or by) the ocean, pour these colours on to heated brass, and that they adhere, become as hard as stone, and preserve the designs which are made in them" (Icones I., ch. xxviii.). Here is the passage in the original text:—

Ταῦτα φασὶ τὰ χρώματα τοὺς ἐν Ὠκεανῷ βαρβάρους ἐγχεῖν τῷ χαλκῷ διαπύρῳ, τὰ δὲ συνίστασθαι καὶ λιθοῦσθαι, καὶ σώζειν ἃ ἐγράφη.

Mr. Franks has remarked that "this passage would seem to prove that the art of enamelling was not practised either in Italy or Greece, for the writer was evidently well acquainted with the artistic processes of these

* See "Essay on Vitreous Art." A. W. Franks, "Art Treasures of the United Kingdom."

countries; and had such a mode of decoration been adopted to any extent, would not have spoken of the barbarian performances of that nature."

On the other hand there is a passage in Strabo (lib. iv., ch. 5) in which glass is mentioned in connexion with the trade with Britain, which seems rather to convey that it was imported from Gaul. "They do not pay heavy duties either on what they export into Celtica (Gaul), or what they import from thence: these (last) being ivory bridle ornaments, collars, red amber, and glass wares, and other such small matters."

That the Celts had a translucent glass,* intermediate in texture between their earliest opaque glass and the crystalline glass they made in the time of Pliny [Nat. Hist. xxxvi., ch. 66] seems to be proved by the fact that beads of this kind of glass are occasionally found with Celtic interments in Wiltshire.† Pliny says:—"Indeed, at the present day, throughout the Gallic and Spanish provinces even, we find sand submitted to a similar process." This process he describes in the following passage:—"At the present day there is found a very white sand . . . which is prepared for use by pounding it with a pestle and mortar, which done it is mixed with three parts of nitre, either by weight or measure, and when fused, is transferred to another furnace. Here it forms a mass of what is called 'hammonitrum,' which is again submitted to fusion, and becomes a mass of pure, white glass." Again he says (ch. 69): "There is a glass that is red all through, and opaque, known as 'hæmatinum'—blood-red glass."

The discoveries that have been made from time to time in Great Britain and Ireland of enamelled bronze, silver, and gold objects, bear important evidence to the truth of the testimony of these ancient writers. The knowledge of this art at an early period in Britain is amply proved by the numerous works of the Late Celtic Period.

The most striking examples of this art, and of the use of red enamel in England, are mentioned in the following list:—

Iron sword found at Embleton, near Cockermouth, in Cumberland. Red enamel is seen in rows of squares on the pommel ("Horæ Ferales," Pl. XVIII., fig. 3, p. 193).

* See "Archæologia," Vol. XLVI., p. 84.

† See Thurnam, "Ancient British Barrows," Archæologia, XLIII., p. 499.

Sheath of sword found at Embleton; ornamented with red and green enamel alternately ("Horæ Ferales," Pl. XVIII., fig. 3, p. 193).

Horse-trappings found at Westhall, in Suffolk, enamelled ("Horæ Ferales," Pl. XIX.).

" " " Polden Hill, Somersetshire, enamelled (see "Horæ Ferales," Pl. XX., fig. 10, and "Archæologia," vol. XIV., Pl. XXII., fig. 1).

" " " Norton, in Suffolk, enamelled ("Horæ Ferales," Pl. XIX., fig 4).

" " " Kirkby Thore, enamelled ("Horæ Ferales," p. 195).

[A similar example of Celtic enamelled work has found its way into the Museum of the Uffizi, Florence ("Horæ Ferales," Pl. XIX., fig. 5)].

Bronze enamelled rings for horse-trappings found at—

Westhall, Suffolk ("Horæ Ferales," Pl. XX., fig. 4).
Stanwick, Yorkshire ("Horæ Ferales," Pl. XX., fig. 3).
Alfriston, Sussex ("Horæ Ferales," Pl. XX., fig. 2).

Shields found in the bed of the Thames, near Battersea, in 1857 ("Horæ Ferales," p. 190).

Mr. Elton ("Origins of English History," p. 292) observes:—"The graves on the Yorkshire coast still yield the remains of iron chariots and horse-trappings, and armour decorated with enamel and the red Mediterranean coral. These discoveries were made in the tumuli in the East Riding of Yorkshire. At Grimthorp, a skeleton was found with a spear-head and sword, both of iron, the latter in a curious sheath of bronze, decorated with studs of red coral" (Arch. xliii., p. 475). The bronzes are embellished with scarlet enamel, like those found at Beuvray.

We may now pass on to note some of the Scottish examples.

Sir Herbert Maxwell has recorded the discovery of a fine example of an enamelled portion of a horse-trapping at Auchendolly, in the stewartry of Kirkcudbright, turned up by the spade of a labourer at work in a drain in

the neighbourhood. It is semilunar in form, ornamented with the trumpet pattern, or divergent spiral, and with that variety of this design which belongs to the late Celtic, or pre-Christian period of art in Ireland. The ground is excavated for enamel, and was filled in with crimson enamel.

It bears a strong resemblance to another ornament already alluded to, found at Westhall, Suffolk, now preserved in the British Museum, which has been figured in Pl. xx., fig. 4, of "Horæ Ferales."

Dr. Joseph Anderson, in the "Proceedings of the Society of Antiquaries, Scotland," vol. VII., p. 45, describes an enamelled cup of bronze found in Linlithgowshire, which is clearly an importation from "some portion of the area of North-western Europe, where it was touched by Roman culture." Here we see this crimson enamel used with a very beautiful sense of harmonious effect in colour. Two other examples of cups of this class (the foreign type) have been found in England, one in a tumulus in the Bartlow Hills, Essex, the other at Braughing, in Hertfordshire, which latter has been engraved and described by Mr. A. W. Franks in the "Proc. Soc. Antiq., London," 2nd Ser., vol. IV., p. 514. Dr. Anderson also remarks:—

"The Gauls, as well as the Britons—of the same Celtic stock—practised enamel-working before the Roman Conquest. The enamel workshops of Bibracte, with their furnaces, crucibles, moulds, and polishing-stones, and with the crude enamels in their various stages of preparation, have been recently excavated from the ruins of the city destroyed by Cæsar and his legions. But the Bibracte enamels are the work of mere dabblers in the art compared with the British examples. The home of the art was in Britain, and the style of its patterns, as well as the associations in which the objects decorated with it are found, demonstrate with certainty that it had reached its highest stage of indigenous development before it came into contact with the Roman culture" (*loc. cit. supra*, p. 49.)

If it be supposed that the ancient workers in enamel, spoken of by Philostratus as "the barbarians who live by the ocean," included the inhatants of Ireland as well as of Great Britain, and that the practice of their art subsequently spread into Gaul, it may not be irrelevant to note the fact that the district of the Ière Lyonnaise, in which fragments of the

new material, like this Irish block spoken of in Mr. Frank's letter, have been discovered, seem to have been much frequented by the first Irish Christians. In the year A.D. 427, St. Patrick was in this district when at the school of St. Germanus of Auxerre. Brioc, who, according to an ancient manuscript Life, preserved at Rouen, was born in Ireland, arrived there afterwards; and we read that "Germanus and his pupils received him with great joy and worthy honour, yet two there were beyond the rest who embraced him even more affectionately in their sincere love, Patrick and Iltud, the first, the apostle of Ireland, the second, of Glamorganshire.

Mansuetus, first bishop of Toul in the fifth century, is said to have been of Irish birth, and Heric, of Auxerre, describes Michomer, A.D. 443, as a disciple of St. Germanus, who came from Ireland, and visited all these towns which were in the country of Ædui, whose capital was Bibracte, *i. e.* Autun. In A.D. 590, Rachanarius, a disciple of Columban at Luxeuil, became bishop of Autun, and established the Columban rule there, and the youths of Autun, Langres, Lyons, Chalons sur Marne, attended the school of Columban at Luxeuil for instruction. St. Gobain (in Irish, Goban), in A.D. 620, rested at Bibrax, *i. e.* Autun, before he finally settled in the spot which now bears his name in the forest on the banks of the Oise.

It now remains for us to examine how far the Irish may claim a knowledge of the art of enamelling as early as the period bordering on the first centuries of the Christian era.

Mr. Whitley Stokes has, by special request, given me a note containing the linguistic evidence he has collected on the subject; and he remarks that the adverb *anall*, in the following quotation, seems to indicate that the Irish learned to make enamel from the Britons:—

"Cruan .ı. gne don tsencerdacht anall. Cruan .ı. in derg, ⁊ creduma .ı. in buidhe. Maithne .ı. buidhe ocus uaine ocus geal.—O'Davoren's Glossary, p. 71."

"Cruan, *i.e.* a kind of the old art-work from abroad. *Cruan*, *i.e.* the red (kind), and créduma, *i.e.* the yellow. Maithne, *i.e.* yellow and green and white."

In another glossary, contained in H. 3, 18, p. 624, a vellum MS., in the Library of Trinity College, Dublin, a second gloss on the word *Cruan* may

be found, but here Mr. Stokes thinks that the glossographer has erred in translating *Cruan* by white (enamel), since it certainly is "red" or "orange." This passage is as follows:—

"Cruan .ı. geal ⁊ maithne .ı. derg, ut est tri chaeca n-all cruan maithnech riu."

"*Cruan, i.e.* white (enamel), and *maithne, i.e.* red (enamel), as is thrice fifty bridles, with red and white enamel upon them (literally, against them)."

The source of this last-cited gloss is, as Mr. Stokes thinks, to be found in the following passage from the Lebor na hUidre, p. 85, lines 27 and 31:—

"tri .lll. gabur dubglass . . . cona trib cóectaib srían cruanmaith friu."

"three fifties of dark grey steeds with their three fifties of bridles of red and white enamel upon them (literally, against them)."

In the Tripartite Life of St. Patrick, Rolls Series, p. 86, ll. 5–8, it is stated that Patrick was followed from Britain into Ireland by a certain bishop Muinis; and Patrick appointed him over Forgnaide (*i. e.* Forgney, Co. of Longford, diocese of Meath), and left him his credence-table of bronze, and a pipe of gold on it above, and his crozier, and "he left a reliquary which he had made with his own hand, and thereon was made a cross of red enamel and white, with four points of *cruan mon.*" In Irish—Foraccaib a bachaill ut prediximus, ocus foraccaib mind dorigne cona laim feissin . . . ocus doronad cross cruan-moithni fair ocus cethri ardda cruain moin.

Whether we hold that this crimson enamel was first imported into Ireland or an original invention, yet that it was used by the goldsmiths and bronze workers of a very remote period is to be concluded from its appearance in the examples illustrated in Plate XIX. And the history of the Rath in which this lump of enamel was found may cast some collateral light upon its probable date. In offering a few remarks, principally gathered from the essay by our great archæological master, George Petrie, on the "Antiquities of Tara Hill," the conclusions indicated may be a sufficient excuse for such a digression.

The ancient topographical work called the Dinnseanchus contains a poem ascribed to Amergin, a writer of the sixth century, in which the Rath of Caelchu is described as one of the monuments at Tara.

Here we read, in the Irish notes appended to this poem—"The grave of Caelchu and his Rath are near the northern head of Long na m-ban. This Caelchu, the son of Loarn, the son of Ruadh, the son of Cas, was one of the Eoganachts of Cashel, the most distinguished of all the men of Munster for wisdom, and from him the chiefs of Ros-Teamrach and the tribe of Tuath-Cis, at Temur, are descended."

In another poem, quoted later on by Dr. Petrie, there is the verse—

> "The *Lecht of Caelchu*, a heap of stones,
> North-east of the *Lorg ban Teamhrach*."

The remains on the Hill have been identified with the descriptions given of them in these ancient poems, and Dr. Petrie describes the Rath of Caelchu, in which this lump of enamel was found, as follows:—

Proceeding now to the northern extremity of the Hall, these descriptions of the ancient topographers place here the Rath of Caelchu, and the Leacht, or grave. Both authorities state that this Caelchu was the great-grandson of Cormac Cas. He was cotemporary with the monarch Cormac mac Art and his son Carbre Lifechair. This Rath and Leacht still remain, and the measurements of the former will be seen in the section on a scale of 60 feet to one inch.

On the western side, the interior of this rath is $5\frac{1}{2}$ feet higher than the ground on the outside, at the eastern side is 7 feet high. The Leacht or grave is situated to the N.E. side of the rath, and is a small mound about 3 feet higher than the outer circle, which seems, evidently, to have been enlarged for it. This mound is of an oval form, and is 26 feet in diameter from north to south, and 20 feet from east to west, at the base. It is about $6\frac{1}{2}$ feet higher than the surface of the hill, and $1\frac{1}{2}$ lower than the rath.

It is not unlikely that bronze workers, armourers, and jewellers carried on their works in the neighbourhood of the kingly palace of Tara. In the poem, already quoted, we find many allusions to such.

"In the house of Temur, round which is the rath," we read of beds which lightning did not burn (iron beds?), of the stout smith, of the engraver and shield maker, the cashel builder and artizan. And we must remember that the period alluded to, in which these artists worked at Tara,

was before the middle of the sixth century. Tara was abandoned, as a royal residence, after the death of King Dermot, in the year 565. Such a mass of crude enamel as this, which has been unearthed in the Rath of Caelchu, was, probably, required by some of these workers in metal who inhabited them before this date. The testimony of the Irish Annalists as to the goldsmiths and jewellers' work in Ireland before the year 565 should not be ignored. The artificers and smiths of this early period are celebrated, and their works—shields, swords, chariots, gold and silver brooches, and pins, chains, jewels, are specified by these chroniclers. Airgtech, before the Christian era, Brigid, the goddess of poets and smiths, Enna, the worker in silver, are spoken of.

The silver shields, from which the wood on the banks of the Nore takes its name of Airget Ross, were wrought by Enna Airgtech, and given with horses and chariots to the men of Ireland in pre-Christian times. Gold was first smelted in Ireland at Kippure, in Wicklow, by Ugdan, a goldsmith that dwelt near the Liffey, who made "gold and silver pins to put in men's and women's garments about their necks."*

An artificial hand of silver is said to have been manufactured by the artist Credna and physician Dianacht for the mythical King Nuada, in the legend of the battle of Moytura,† and Balor, a Fomorian chief, gets spears forged.

Muineamhon,‡ who is said to have flourished two centuries before Christ, recorded in the Annals of Clonmacnois as having been the first king that devised gold to be wrought in chains fit to be worn about men's necks, and rings to be put on their fingers, which were then in great use." About the dawn of the Christian era, Cuileann, the artificer, flourished, who gave his name to Slieve Gullion, a mountain in Armagh.

Thuthal, A.D. 107, is wounded in the "valley of the Smith." The three smiths of St. Patrick, as well as his three artificers mentioned in the years 448, were Irishmen, as is proved by their names.

Dr. Petrie has published an ancient ground-plan showing the arrange-

* See "Annals of the Four Masters," vol. i., p. 41, note.

† See O'Flaherty's "Ogygia," Part III., c. 10.

‡ See "Annals of the Four Masters," vol. i., p. 53, note.

ments of the dining hall of Tara, taken from the "Book of Glendalough."* The places occupied by the several ranks of the royal household are here mapped out, and we find that the place allotted to smiths, shield makers, and chariot makers, is in the internal division to the left. Engravers and ring makers have their places in the same division; and in the "Yellow Book of Lecan," it is stated that the cearda (smiths) worked in gold and silver only.

Two of the finest torcs in the Academy's Museum come from Tara. They were found at Tara by a peasant boy, in 1810, in the side of a rath not far from Rath Caelcon. They are of spiral pattern.

And now it only remains for us to notice the examples of the use of such enamel as is here before us in certain primitive specimens found in Ireland of bronze work which have been selected from the Academy's Museum, and which are illustrated in Plate XIX.; then to add a short list of such examples of its occurrence in works of the best Christian period of Irish art, the dates of which have been ascertained.

No British example of Late Celtic bronze ornament has excelled two fragments (Pl. XIX., fig. 2) in the Petrie Collection in beauty of design and delicacy of execution. They are figured in "Archæologia," vol. XLVII., Pl. XXII., but with uncoloured figures.

Red enamel was sparingly used here, yet that it does appear in *minute spots* at the centre of the spiral design is proof sufficient that this enamel was used for decoration in Ireland before the date of her Christian Art.

These bronze fragments are held to be portions of a radiated crown—a form of crown which is first represented on the coins minted in Gaul and Britain in the years A.D. 260, 287, and 293, *i.e.* a century before the introduction of Christianity into Ireland. The design which forms their ornament is the earliest variety of that which has been termed the trumpet-pattern, or the divergent spiral like that on other bronzes of the late Celtic and pre-Roman period in Britain, *i.e.* between 200 years before Christ and 200 years after His coming. Other examples of this variety may be seen in the Academy's Museum in the bronze discs found at Monasterevan, and in the spoon-shaped relics found in a bog in Ireland, which correspond to those

* See these *Transactions*, vol. xviii., p. 187.

described by Mr. Albert Way (Arch. Journal, XXVI. 52; Arch. Cambrensis, 4th Ser. i. 199), a variety coming between the primitive form seen on certain stone and bone relics of a pre-Christian period in Ireland, and the more complex forms occurring on the Christian monuments.

An example of the use of enamel on bronzes of the late Celtic period found in Ireland is to be seen in the Royal Irish Academy's Museum on a very large bronze head ornament for horse harness commonly called a headstall, though Sir William Wilde, in his Catalogue, seems to think these objects were worn as pendants below the horse's mouth. The boss at the top of this object is ornamented with the double spiral, or trumpet pattern, inlaid with enamel of a dark, warm colour.

Another portion of horse-trapping in the Petrie Collection, which was presented to Dr. Petrie by Mr. W. F. Wakeman, is inlaid with crimson enamel. A coloured illustration of this beautiful object is placed on the table (see Pl. XIX., fig. 1).

A very remarkable knife-handle offers one of the rarest instances we know of where crimson enamel is laid on iron, the crown of Charlemagne being the most perfect example we have of enamel on iron (Pl. XIX., fig. 3).

Crimson glass appears in the top of an exquisite pin belonging to the Petrie Collection, which was found at Clonmacnois, and is a very perfect example of glass-work (see Pl. XIX., fig. 6). The pin is of bronze, inlaid with ornaments of glass; a rose pattern, white on blue ground, $\frac{1}{8}$th inch diameter, is set at either side of a diamond-shaped ornament, consisting of a centre of translucent crimson glass on a diaper pattern of yellow and white. A star of crimson and blue occurs six times along the side of the pin. Here it would seem that these pieces of coloured glass were put together so as to form a mosaic work of cones of different colours; that they were fused together and drawn out, and the pieces used in the ornament are sections of the cones when drawn out.

Crimson enamel appears on another pin of delicate workmanship, with divergent spiral designs, found at Clonmacnois; it is of gilt bronze (Pl. XIX., fig. 4)—a fine tracery runs round the stem of this pin. A primitive representation of the Three Holy Children appears on the back, their heads

like three round balls coming out of a semicircular basin representing the furnace.

The same enamel is also to be seen on a bronze ornament, probably a clasp or some portion of a horse-trapping preserved in the Museum of the College of St. Columba, Rathfarnham.

A fine bronze bit (see "Kilk. Arch. Journal," 2nd Ser., vol. I., p. 423), which was found at Killeevan, near Analore, in the county of Monaghan, is ornamented with the trumpet pattern and crimson enamel (Pl. XIX., fig. 5). We find it also in small particles on a bronze pin found at Monasterevan in 1872; and on a bronze fibula, No. 134; and on bronze bits found in Co. Galway, all of which are in the Academy's Museum.

When we come to the question of its use in our ecclesiastical antiquities, we may say that there is scarcely one example in which crimson enamel does not appear, yet it is impossible to fix the date of any one of these before the year 954, when we find enamel on the bell-shrine of Maelbrigde, son of Redan, Bishop of Connor. The material is bronze, overlaid with ornaments, and gold and silver interspersed with enamels. It is probable that the shrine of St. Mogue is older work than this, and on the base of this beautiful reliquary the crimson enamel is seen to perfection. It is visible on the hinge of the shrine of St. Molash, of Devenish—executed in 1001—on the Ardagh chalice, the enamels on which have been elaborately described by the late Professor Sullivan (these Transactions, vol. XXIV., p. 433). On the crozier of Lismore we see crimson enamel among the other colours on the bosses—interspersed with ornaments of silver and niello—of the year 1101. And on the back of the Cross of Cong, A.D. 1123, there are sixteen circles with red and blue enamels on the bosses by which they are filled. Our list must close with the shrine of St. Manchan, executed in 1166. On each side of this reliquary there is a cross elaborately ornamented, and united by arms, each of which contains four plates of enamel; the ground of the enamels is yellow, and a pattern is formed on each side by lines of this crimson enamel, which enamel, in texture as in colour, resembles those which ornament the bronze armlets from Castle Drummond, in Perthshire, now in the British Museum.

Such are the most striking examples of the use of this crimson enamel that have been found in Ireland. Mr. Franks observes: "The ancient processes seem to have lingered in Ireland, as we find some of the details of the earlier shrines executed in enamel. In other parts of the West all traces of enamelled ornaments were swept away by Teutonic invasions. The jewellery of the conquerors does not appear to have been enriched with enamel. The horse-trappings so decorated are peculiar to England and Ireland. There is not a single example of such in Scandinavia."

In conclusion, these observations are not intended to prove that the art of making such enamel did or did not originate in Ireland. Neither is it desired to establish any theory as to whether such a mass of raw material as we have here was of native manufacture, or was not. Such questions cannot be decided in the present state of our ignorance as to all that relates to Irish pre-historic and pre-Christian antiquities. Yet it may be observed that an impression prevails among some antiquaries, that because ancient styles and processes lingered on in Ireland to a later date than elsewhere, therefore she was at all times behindhand. It may be, on the contrary, that because such art was an original development the people clung to it with the greater tenacity. It is certainly true that the early style of encrusted enamel—called by the French *champlevé*, or *à taille d'épargne*, was the style still practised in Ireland to a late period. But, when we consider the evident antiquity of the material—corresponding with examples of a similar composition in pre-Christian work elsewhere; when we find that it is exactly the same in colour and in texture as that used in the bronze ornaments of the Late Celtic period; and note that the rath in which it was found was deserted in the sixth century, and therefore this deposit was probably made before that date. When we read the testimony of ancient writers as to the splendour of our ancient horse-trappings, and find enamelled bronze bits, loops, and clasps, all fragments of such furnishings discovered in this country, and now in our Museums, it is impossible to avoid the suggestion that this lump of crimson enamel was raw material in the workshop of some goldsmith or jeweller in the Rath of Caelchu, on Tara Hill.

DESCRIPTION OF PLATE XIX.

Figure 1.—Horse-trapping. Inlaid with crimson and yellow cement. (From the Petrie Collection.)

„ 2.—Part of a Bronze Ornament. Late Celtic. (From the Petrie Collection.)

„ 3.—Knife-handle. Enamel on Iron. (From the Petrie Collection.)

„ 4.—Pin of gilt bronze, inlaid with crimson enamel. (From the Petrie Collection.)

„ 5.—Bronze bit, found in the County of Monaghan. Late Celtic.

„ 6.—Pin of bronze, inlaid with glass. (From the Petrie Collection.)

All the above are in the Royal Irish Academy's Museum, in the Science and Art Museum, Dublin.

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4.

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Lith. Werner & Winter, Frankfort o/M.